5   PATENT APPLICATION

AN iPOS TRANSACTION SYSTEM

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AN iPOS TRANSACTION SYSTEM

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BACKGROUND

[0001]   This invention relates to point-of-sale (POS) systems and retail stores. More specifically, this invention relates to transaction terminals at POS locations in small retail stores.

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[0002]   Brick-and-mortar retailers may be divided into three classes based on the number of registers at a store. A tier-1 retailer may have, say, twenty-six (26) or more cash registers at one store. A tier-2 retailer may have 3 to 25 cash registers. Tier-3 retailers have one or two registers per

15   store. (These tiers may overlap at their boundaries.)

[0003]   The cash registers at the tier-1 and tier-2 stores, termed "electronic cash registers" or "ECRs," tend to be qualitatively different from the registers at tier-3 stores. A tier 1-tier 2 cash register may cost $5,000 or more. For its expense, an ECR is programmed or programmable to handle

20   activities beyond that of a cash register. In an integrated POS system, an ECR may communicatively couple with a POS device such as a check reader or a magnetic-strip reader. The ECR has sufficient intelligence to control the POS device, say, to obtain credit- or debit-card information from the magnetic-strip reader, combine it with the transaction total that

25   the ECR has computed and forward it all to an external payment processor for authentication and approval. The IBM ECR model 4690, available from International Business Machine Corporation, Armonk, NY, is an example of a prior-art ECR.

[0004]   In comparison, the cash registers of tier-3 retailers are typically

30   much less sophisticated. These cash registers cost about $500 to $800 — significantly less than the tier 1-tier 2 ECRs. For their affordability, stand-

beside cash registers are not able to control POS devices co-located with the cash register. Any magnetic-strip/POS reader located with such a tier-3 register, for example, itself possesses the intelligence to send card information to a remote payment processor for authorization.

5   [0005]   **Figure 1** illustrates a prior-art POS transaction environment **200** for a tier-3 POS location. The POS transaction environment **200** includes a cash register **210**, a payment-processing device **220** (optionally integrating a check/magnetic-strip reader **221** and a printer **222**), a PIN pad **230** and a communications link **240**. The link **240** communicatively connects the

10 device **220** and the PIN pad **230**.

[0006]   In a retail system including the transaction environment **200** and a remote payment processor **300**, a link **400** communicatively connects the transaction environment **200** — through its device **220** — to the payment processor **300**. Notably, the cash register **210** and the

15 payment-processing device **220** do not communicate.

[0007]   The OMNI models 460 and 470, available from VeriFone, a division of Hewlett-Packard Company, Palo Alto, California, with their printer 900 and CR 600 check-reader options, are examples of prior-art payment processing devices **220**. The OMNI 460 has automatic-payment-

20 processing and receipt-printing capabilities. The OMNI 470 combines a payment terminal, a printer and a PIN pad. Both OMNI terminals can transfer data via modem. Eclipse-brand payment terminals convert paper checks into electronic items for instant funds transfer from a customer's account to the merchant's.

25 [0008]   Hypercom, Inc., Phoenix, Arizona, makes T7 and T8 series of transaction terminals. The T7 series include a 35-key keyboard, LCD display, a card reader and a receipt printer.

[0009]   IVI Checkmate, Roswell, Georgia, makes an eN and Elite series of transaction terminals with PIN-pad and receipt-printer peripherals. Most

30 of these terminals have direct-dial capability, integrated card readers and an LCD. Functions such as check reading, thermal receipt printing and

wireless communication are optional.

[0010]   In this tier-3 environment, processing a credit-card payment involves the cashier determining the dollar amount of the transaction using the cash register **210** and sliding the credit card through the

5 check/magnetic-strip reader **221**. The cashier then enters the transaction dollar amount into the device **220**. The MSR **221** provides the requisite card information such as card number and expiration date. The device **220** then (dials and) communicates with the remote payment processor **300** to authorize the transaction. Upon authorization, the printer **222** prints a paper

10 receipt which the customer then signs.

[0011]   Processing a debit-card payment is similar: Instead of signing a paper receipt, the customer enters a PIN on the separate PIN pad.

[0012]   Such a credit or debit transaction may take 6 to 22 seconds, depending on the type of connection with the remote payment processor.

15 The customer idly waits for the transaction approval. Except for the entry of a PIN (if ever necessary, for a debit-card transaction, for example), the customer does not interact at all with the transaction system **200**.

[0013]   While such a setup allows the merchant to use credit- or debit-cards as payment for goods or services at a cost much less than with

20 integrated ECRs, the setup obliges the retailer to forgo certain additional sources of revenue. For example, the intelligence of the payment-processing device is limited to communicating and authorizing transaction information.

[0014]   Accordingly, the art seeks a tier-3 POS environment that is less

25 costly than the tier-1 and tier-2 environments but nonetheless offers the opportunity to convert the idle times of the customer into potential revenue.

[0015]   These and other goals of the invention will be readily apparent

30 to one of skill in the art on reading the background above and the description below.

SUMMARY

[0016]   Herein are described apparatus and methods for transaction processing. The apparatus may be a transaction system including a keypad, a circuit for interacting with a customer and a link communicatively connecting the keypad and the customer-interaction circuit.

[0017]   The cashier may interact with the keypad, while the customer (and not the cashier) may interact with the customer-interaction circuit. The link may communicate a dollar amount for the transaction between the keypad and the customer-interaction circuit.

[0018]   Accessories for the customer-interaction circuit may include a check reader, a receipt printer, a smart-card reader, a magnetic-strip reader and a biometric-information circuit.

[0019]   The customer-interaction circuit may include a port for connection to a remote service provider. That port may be the only remote-access port in the transaction system.

[0020]   The customer-interaction circuit may include a virtual PIN pad, and the circuit itself may be programmed to capture a personal identification number (PIN) by means of that virtual PIN pad. The customer-interaction circuit may include virtual paper, and the circuit itself may be programmed to capture a signature by means of the virtual paper.

[0021]   A cash register at the point of sale with the transaction system may not be communicatively coupled to the transaction system.

[0022]   A method for authorizing a transaction at a POS location may include engaging in a transaction at the POS location, thereby generating a dollar amount for the transaction. A transaction dollar amount is entered into a keypad and then communicated from the keypad to a customer-interaction circuit. Details of the transaction, including the dollar amount, are communicated to a remote service provider for authorization. During the step of entering and both steps of communicating, the customer-

interaction circuit interacts with the customer. Between the steps of communicating, the transaction dollar amount maybe displayed on the customer-interaction circuit for the customer, and the customer may approve the transaction dollar amount.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0023]   **Figure 1** illustrates a prior-art POS transaction environment for a tier-3 POS location.

[0024]   **Figure 2** illustrates a retail system incorporating an embodiment
10   of the invention.

[0025]   **Figure 3** illustrates the point-of-sale (POS) transaction system of **Figure 4**, according to one embodiment of the invention.

[0026]   **Figure 4** illustrates a point of sale incorporating an embodiment of the invention.

15   [0027]   **Figure 5** schematically illustrates a customer-response unit, according to one embodiment of the invention.

DESCRIPTION OF SPECIFIC EMBODIMENTS

[0028]   **Figure 2** illustrates a retail system **100** incorporating an
20   embodiment of the invention. The retail system **100** includes one or more merchants **110**, one or more remote payment processors **120**, one or more application service providers (ASPs) such as the electronic-receipt service provider **140**or the customer-relations manager **150**, and a communications link **130**.

25   [0029]   The link **130** communicatively couples the merchant **110** to the service providers **120, 140, 150**. Where the link **130** is an internet, the merchants **110** and service providers **120, 140, 150** are each a node on the internet **130**.

[0030]   A merchant **110** may be a small retailer with, say, 1 or 2 cash
30   registers. Example merchants **110** include convenience stores, restaurants, hospitality providers (barkeeps, innkeepers, etc.) and rental-car agencies.

[0031] A service provider **140** may provide an electronic-receipts repository for receiving and storing transaction records. The service provider may provide an electronic-receipts service for manipulating a transaction record — retrieving and forwarding it on demand, for example. The website www.Crossvue.com, made available by Crossvue.com, San Jose, California, is an example of an electronic-receipts service ASP **140**.

[0032] The service providers **120** support the transactions of a merchant **110**. An application service provider **120** (a payment processor or one of its affiliate banks, for example) may verify credit or debit cards or may authorize credit- or debit-card transactions.

[0033] The service-provider **150** may be an advertisement server. Doubleclick.com, New York, New York, is an example of a service provider **150**. Indeed, the service provider **150** may serve up any content that a customer may find interesting or that may provide useful information. (For example, the lack of an (affirmative) customer response to an advertisement, promotion or survey is of itself an interesting response.)

[0034] The merchant **110** includes a point of sale (POS) **111** incorporating an embodiment of the invention. **Figure 4** illustrates that POS 111, including a cash register **210** and an iPOS transaction system **1111**.

[0035] **Figure 3** illustrates an interactive point-of-sale (iPOS) transaction system **1111** according to one embodiment of the invention. The iPOS transaction system **1111** may include a numerical keypad **220**, a customer-response unit (CRU) **500** and a communications link **600**. The link **600** communicatively couples the keypad **220** and the CRU **500**.

[0036] The keypad **220** typically includes an LCD display **221**. In use, the keypad **220** assists the cashier. The keypad **220** may receive from the cashier the dollar amount of a given transaction for debit- or credit-payment processing.

[0037] The CRU **112** interacts with the customer to complete or enhance the transaction. **Figure 5** schematically illustrates a CRU **500**, according to one embodiment of the invention. The CRU **500** may include

a processor sub-system **510**, a biometrics sub-system **520**, an input sub-system **530**, an output sub-system **540**, a payment sub-system **550**, a communications sub-system **560** and a bus **570**. The bus **570** communicatively couples all of the biometrics, input, output, payment and communications sub-systems **520, 530, 540, 550, 560** to each other and to the processor sub-system **510**.

[0038]   The processor sub-system **510** includes a CPU **511**, a memory **512** and a bus **513**. The memory **512** includes random-access memory (RAM) **5122** and may include flash memory **5121**. The bus **513** communicatively couples the CPU **511** and the memory **512** and may be wholly or partly integral with the bus **570**.

[0039]   The memory **512** includes software (not shown) controlling the CRU **500** according to its roles described herein. The memory **512** also contains drivers and other software as necessary to operate the input, output and payment sub-systems **530, 540, 550**.

[0040]   The biometrics sub-system **520** electronically captures biometric information such as fingerprints, retinal images or facial features.

[0041]   The input sub-system **530** may include a touch pad **531**, and the output sub-system **540** may include a display **541** that is preferably a color liquid crystal display (LCD). The touch pad **531** and the display **541** may combine to create a virtual PIN pad for numeric entry or virtual paper for electronic signature capture, as are known in the art.

[0042]   The payment sub-system **550** may include a magnetic-strip reader **551**, a smart-card processor **552** and a bus **553**. The bus **553** may communicatively couple the magnetic-strip reader **551**, the smart-card processor **552** and the bus **570**. The bus **553** may be wholly or partly integral with the bus **570**. (In one embodiment, the input system can also handle the other types of payment mentioned herein.)

[0043]   The communications sub-system **560** includes a low-bandwidth port **564**, a high-speed communications port **561** and a bus **565**. The bus **565** communicatively couples the ports **564, 561** to the bus **570**. The bus

565 may be wholly or partly integral with the bus **570**.

[0044]   The low-bandwidth port **564** is preferably serial, particularly an RS-232 or RS-485 port. The high-bandwidth port **564** is preferably a local or wide area network connection, such as the Internet over a digital

5   subscriber loop or line (DSL).

[0045]

[0046]   In an example transaction, the cashier enters the dollar amount of the transaction, using the RCK **220**. The cashier's data entry is typically asynchronous to the customer's activities. The cashier-side

10   keypad **220** communicates this dollar-amount information to the CRU **112**, using the link **113**. The customer uses the CRU **112** to select a payment option. In response, the CRU **112** prepares to accept the selected payment method. The customer inserts his card, swipes his card or otherwise presents his payment method as determined by the chosen

15   option. For debit cards, the customer enters a PIN using the virtual PIN pad of the CRU **112**. The CRU **112** transfers the transaction total and other transaction information to the remote payment processor **120** and waits for an approval.

[0047]   While the CRU **112** waits for the service provider **120** to

20   authorize the transaction, the CRU **112** may communicate with the customer-relations manager **150** over the link **130** to receive content for display to the customer. The CRU **112** also may display transaction information (and card information, if applicable).

[0048]   On approval of a credit transaction, the CRU **112** prompts for

25   the customer's signature. The signature may be electronic.

[0049]   The CRU **112** itself or the keypad **220** may print a receipt which the cashier may hand to the customer. The CRU **112** then may transmit a record of the transaction (and transaction details such as an electronic signature) to the electronic-receipts service **140**.

30   [0050]   The retail system **100** offers tier-3 retailers targeted-marketing opportunities at the point of sale while processing credit and debit

transactions.

[0051]   The numerous embodiments of the iPOS transaction terminal permit the small, tier-3 retailer to minimize cost by choosing an iPOS transaction system **1111** configured exactly for that small retailer's business.

5   The retailer need not pay for functionality that it may never use.

[0052]   Indeed, the invention now being fully described, many changes and modifications that can be made thereto without departing from the spirit or scope of the appended claims will be apparent to one of

10   ordinary skill in the art.

[0053]   This specification incorporates by reference all publications and patent applications mentioned herein, to the same extent if the specification had specifically and individually incorporated by reference each such individual publication or patent application.

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